

VICENZA, 27 Febbraio 2009

Teatro Comunale



Le infezioni postoperatorie nella chirurgia addominale

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Classification of peritonitis

Secondary peritonitis

- Perforation or infarction
 - gastrointestinal tract
 - hollow viscus necrosis
 - translocation peritonitis
 - bacterial translocation

Post-operative

- anastomotic leak
- intestinal obstruction
- stomal stenosis
- surgical site leaks

Nosocomial

- Traumatic
 - blunt trauma
 - open trauma

Surgical guidelines for the treatment of intra-abdominal sepsis

Mortality after peritonitis

Pathologies	Mortality (%)
Perforated appendix	0-10
Perforated peptic ulcer	10-18
Rupture of obstructed viscus	24-35
Biliary peritonitis	25-35
Anastomotic leak	50-75

Intra-abdominal abscesses

INTRA-PERITONEAL

- Subphrenic
- Subhepatic
- Lesser sac
- Pelvic
- Paracolic gutter
- Mesenteric (loop confined)

RETRO-PERITONEAL

PARENCHIMAL

Solitary
Multiple
Multiloculated

Mortality 20-80%

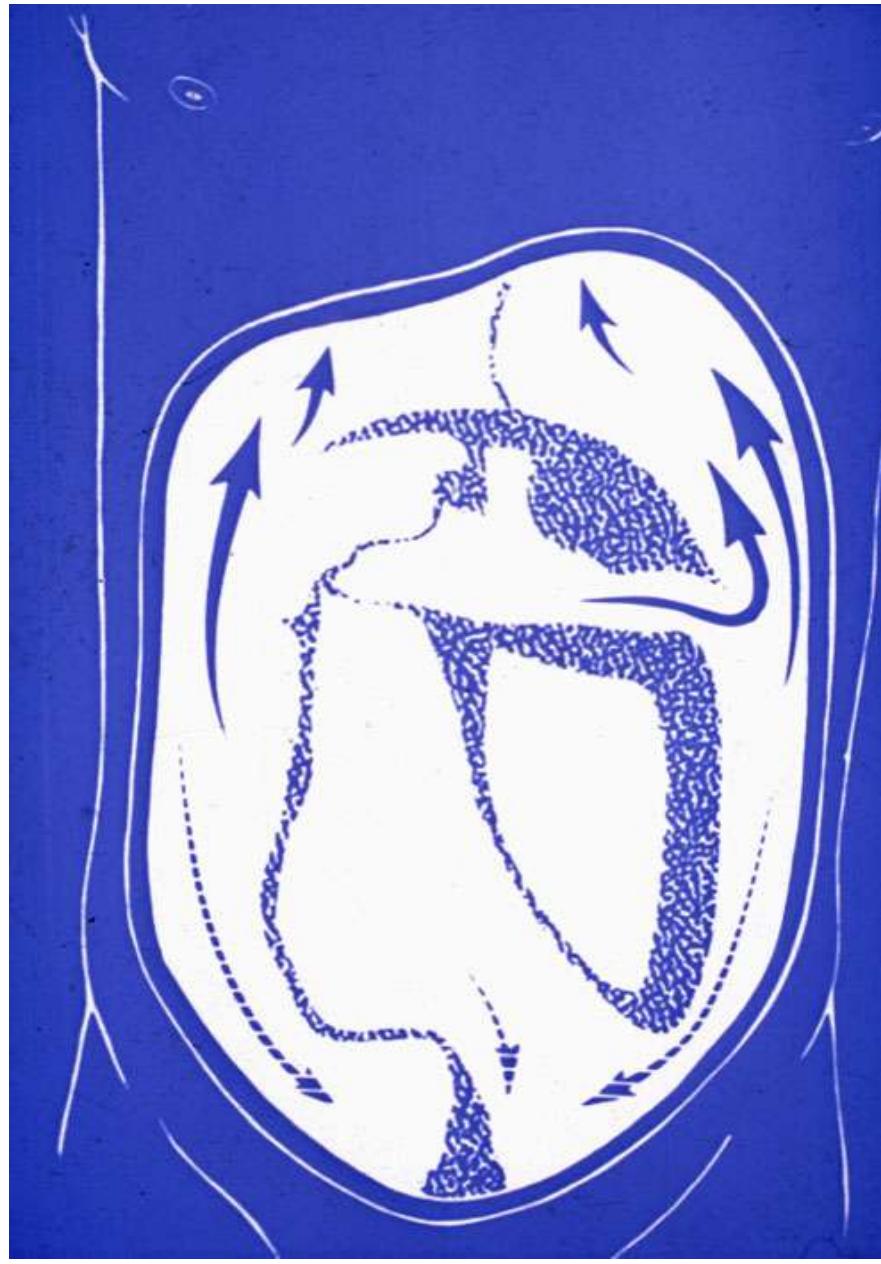
Factors associated with more severe sepsis and higher mortality

- * **Increasing age**
 - * **Non-appendiceal site**
 - * **Certain pre-existing diseases**
 - * **Extent of peritonitis**

SECONDARY BACTERIAL PERITONITIS

Marshall, JC Probl Gen Surg 2002;19:53-64

- Secondary bacterial peritonitis arises as a consequence of injury to an intrabdominal viscus from intrinsic disease or extrinsic trauma. The resulting infection is typically polymicrobial, with aerobic Gram-neg...and anaerobes ...and Gram-pos... The first priority...is **resuscitation** and hemodynamic stabilization ...Definitive therapy is **surgery**... through the drainage of localized collections or abscess, the debridement of necrotic tissue...and adequate source control. Prognosis is determined primarily by source control... **antibiotics** are fundamental to reduce the extension of infection, to control bacteremia, to decrease the incidence of wound infection...**relaparotomy** may be required...



"Drainage of general peritoneal cavity is physically and physiologically impossible"



Mediators in sepsis and mof

HORMONS

LEUKOTRIENES

PROSTAGLANDINS

PROTEOLIC ENZYMES

TNF

OXYGEN FREE RADICALS

INTERLEUKINS
(IL1, IL2, IL6, IL10, IL20 ...)

NITRIC OXIDE

COAGULATION

ENDORPHINES

COMPLEMENT

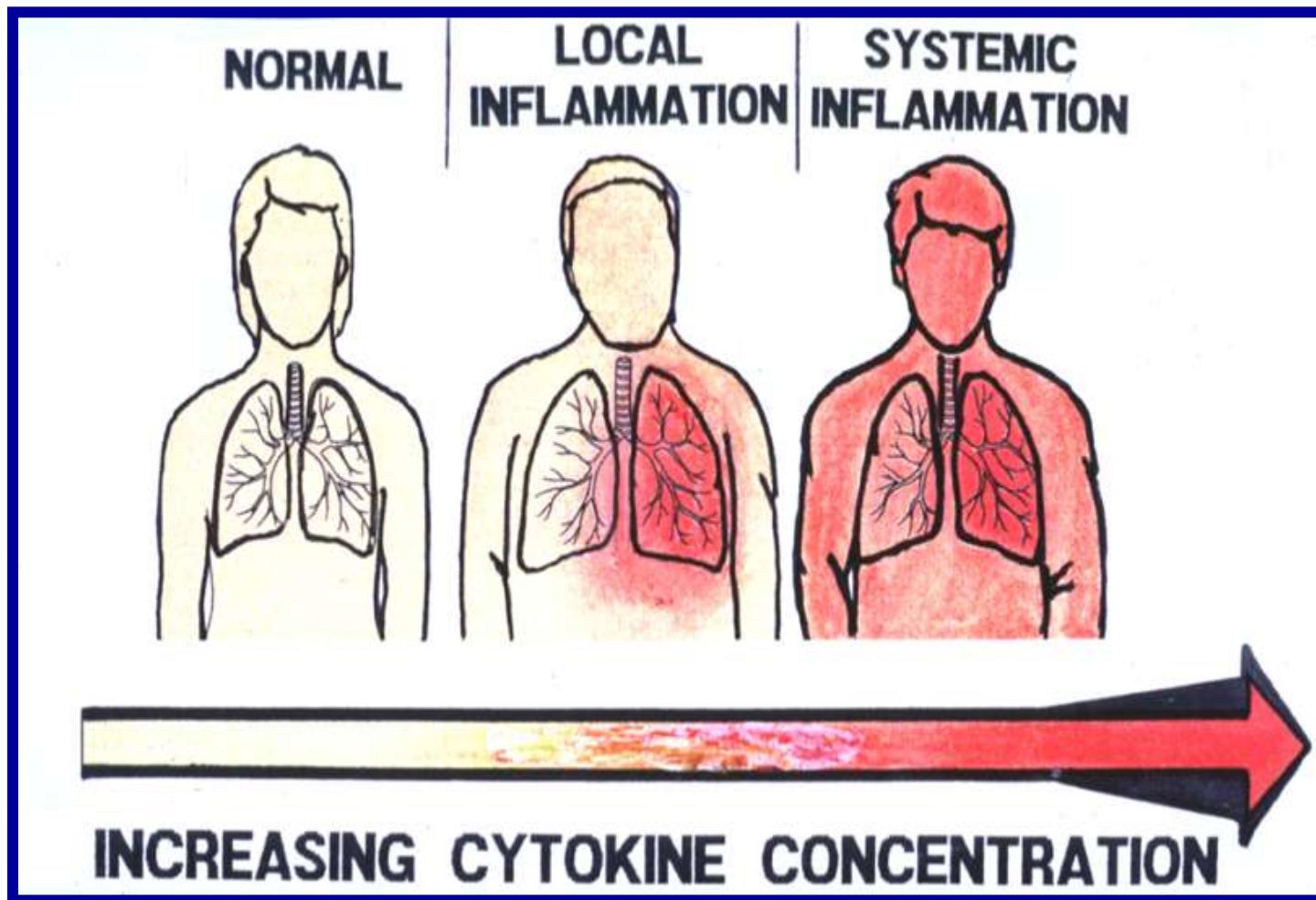
PAF

MYOCARDIAL
DEPRESSANT
FACTOR

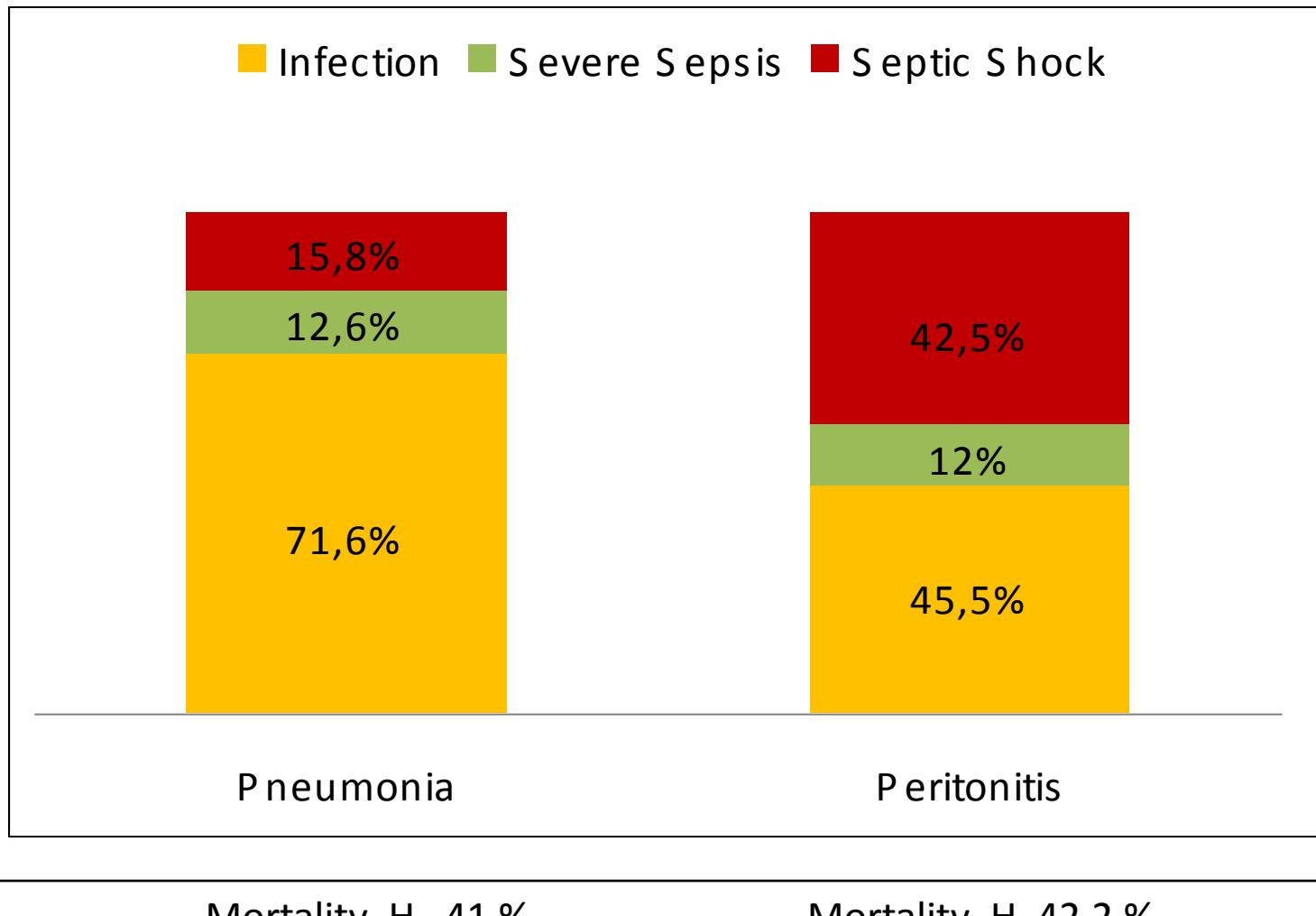
HYSTAMINE
SEROTONINE



PATHWAY OF INFLAMMATION



SEVERITY of CA-INFECTIONS



Typical pathophysiological sequence leading to MOFS



PERITONITIS - SIRS

ABSCESS/DIFFUSE PERITONITIS - SEPSIS

SEVERE SEPSIS

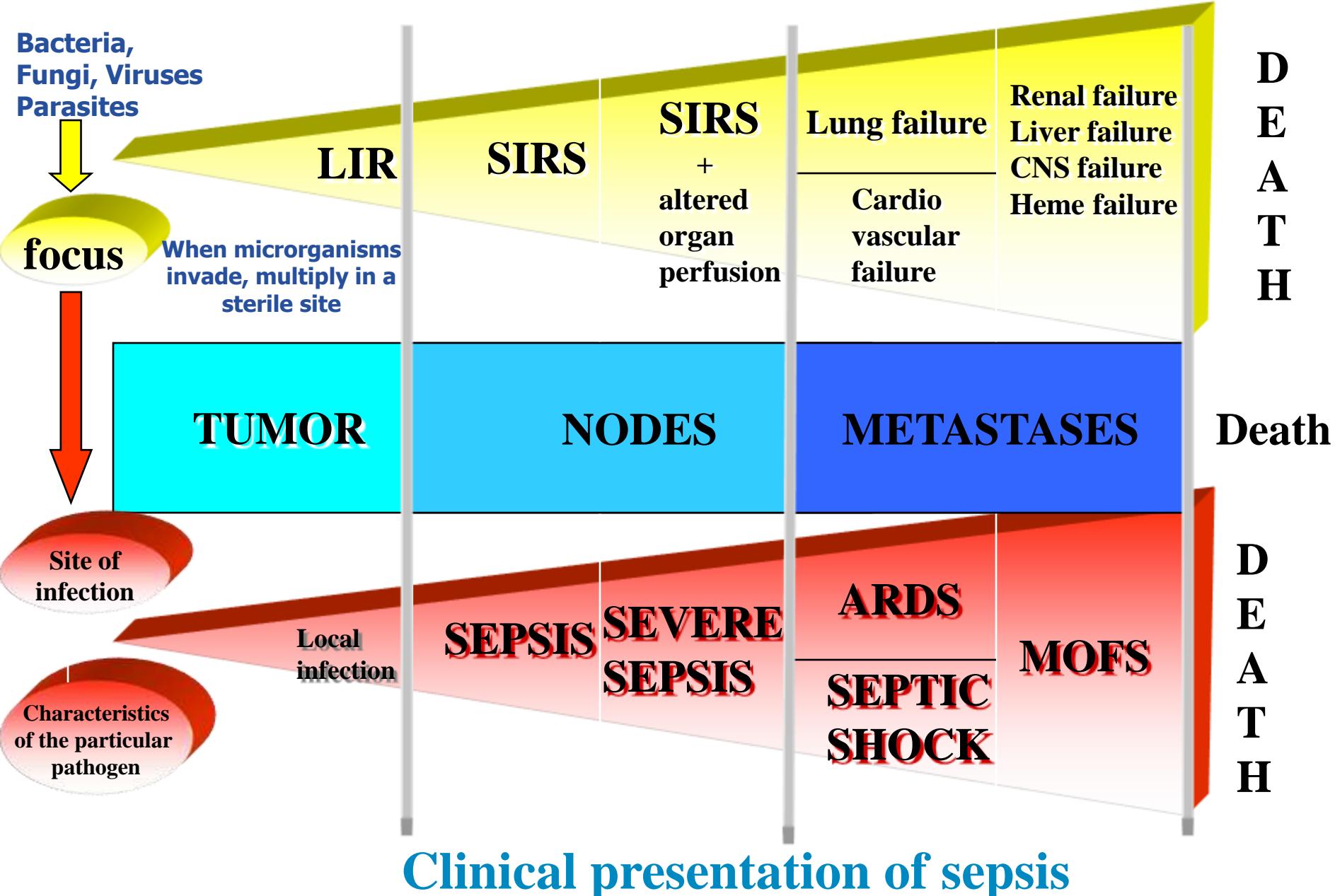
MODS

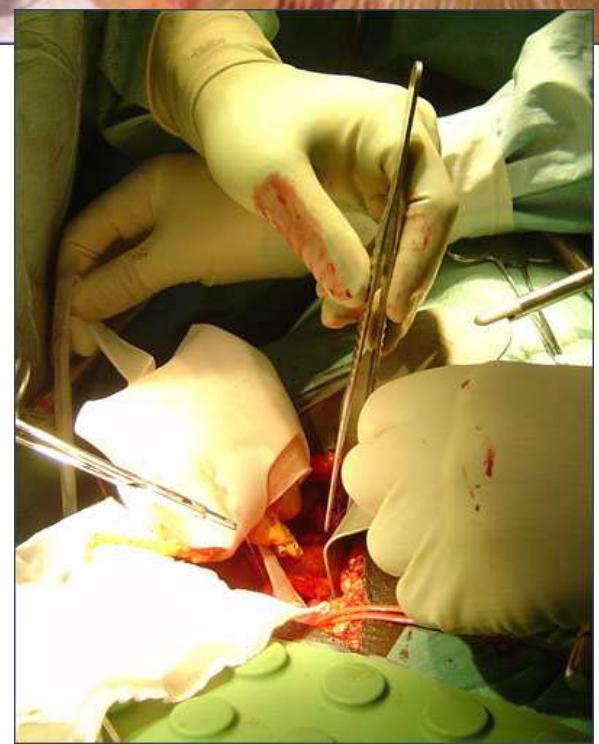
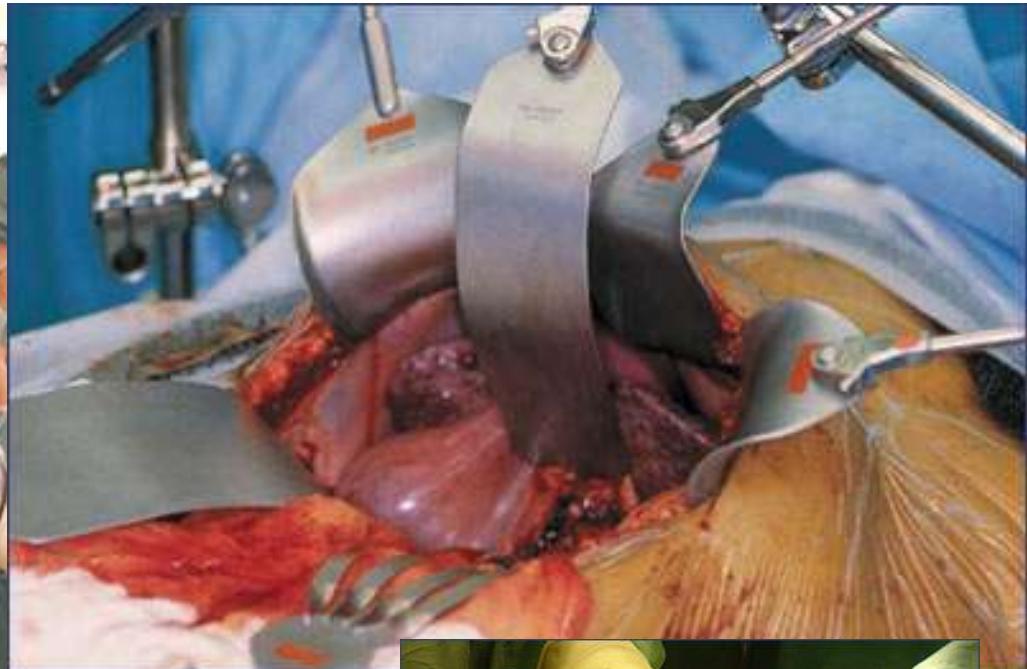
**ARDS
ARF - HF
DIC ...**

MOFS



Sepsis the systemic response to infection





Lee SW Surg End, 17(12):1996-2002, 2003

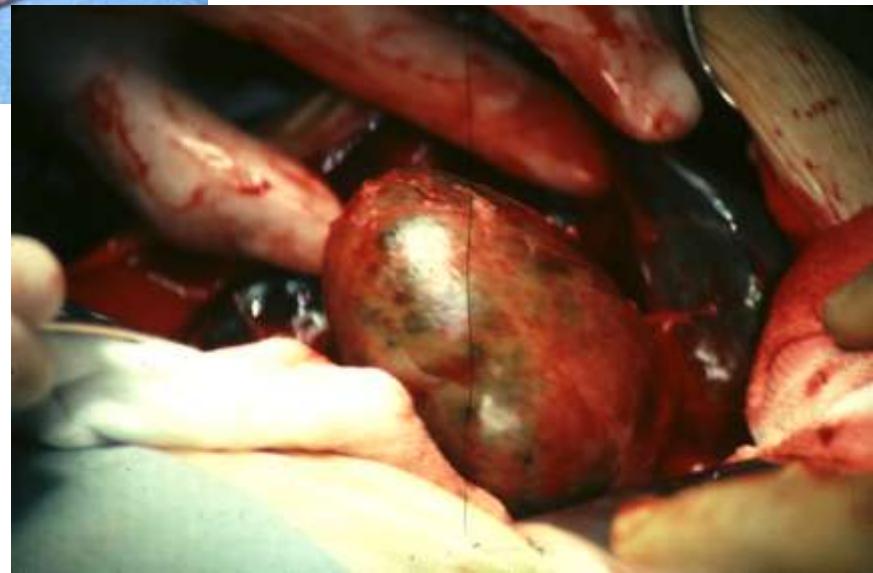
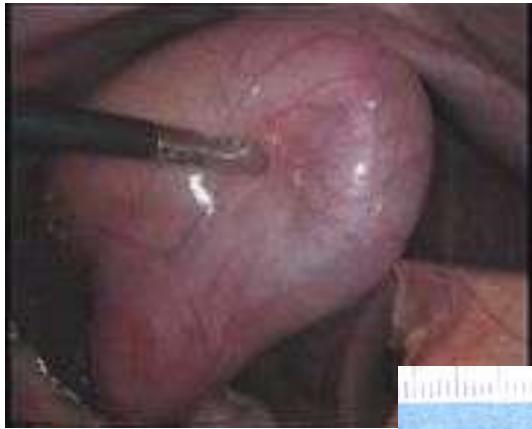
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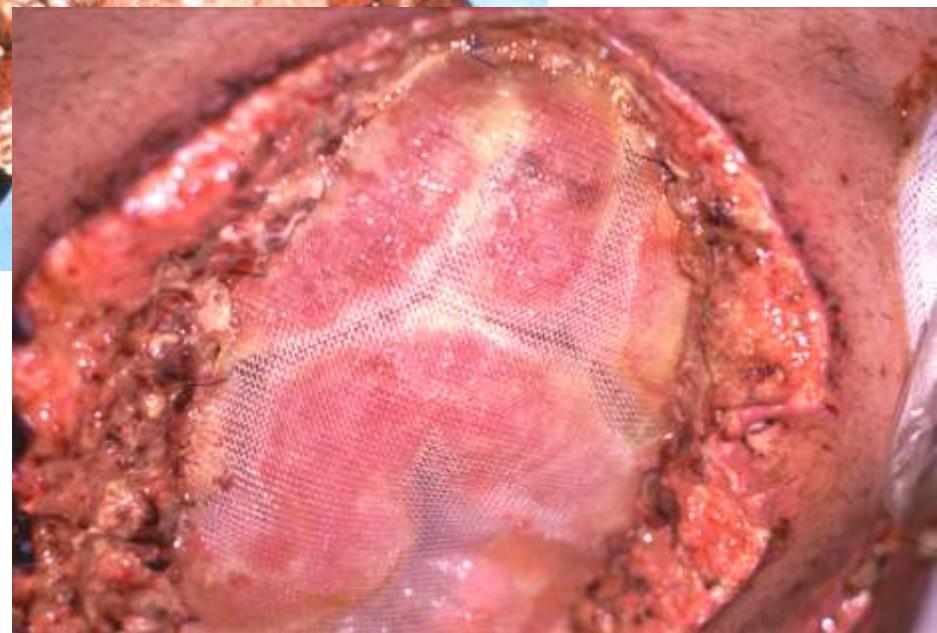
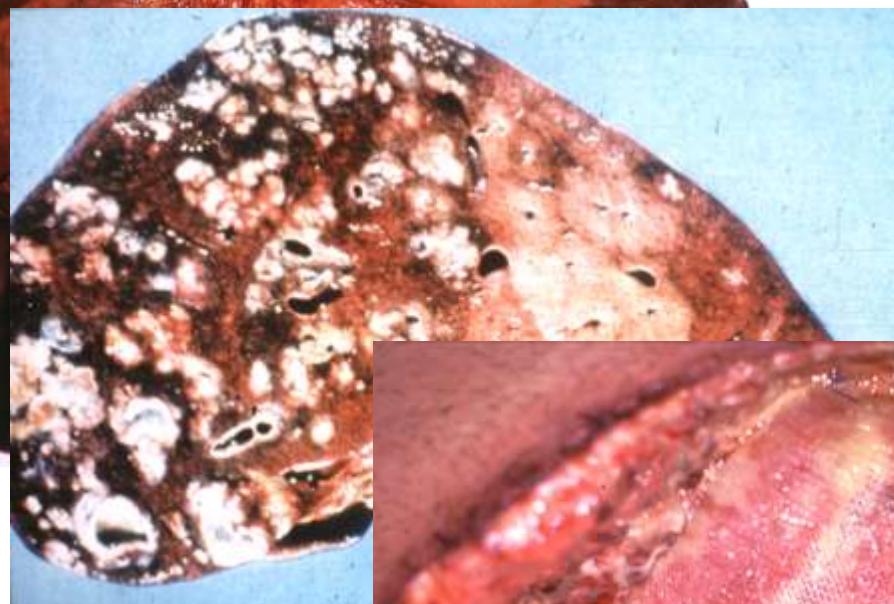
complicated Intra-Abdominal Infections

... are defined as infections that extend beyond the hollow viscus of origin into the peritoneal space and that are associated either with abscess formation or peritonitis.

These infections require either operative or percutaneous intervention to resolve, supplemented by appropriate antimicrobial therapy.







Linee guida disponibili

Paese	Anno	Autore	Società
	2002	Mazuski JE	Surgical Infection Society
	2003	Solomkin JS IDSA	Infectious Diseases Society of America Surgical Infection Society American Society for Microbiology Society of Infectious Disease Pharmacist
	2005	Tellado JM	Sección de Infección Quirúrgica-Asociación Española de Cirujanos Grupo de Enfermedades Infecciosa Sociedad Española de Medicina Intensiva y Unidades Coronarias Sociedad Española de Medicina Interna Sociedad Española de Medicina de Urgencias y Emergencias Sociedad Española de Quimioterapia
	2006	Laterre PF	Infectious Disease Advisory Board

Infezioni lievi-comunitarie

Solomkin JS	Mazuski JE	Tellado JM	Laterre PF
<ul style="list-style-type: none">• Ampicillina/Sulbactam• Ticarcillina/Acido clavulanico• Ertapenem• Cefazolina o Cefuroxime + Metronidazolo• Ciprofloxacina, Levofloxacina, Moxifloxacina o Gatifloxacina, + Metronidazolo	<ul style="list-style-type: none">• Cefoxitina• Cefotetan• Ampicillina/ Sulbactam• Ticarcillina/ acido clavulanico	<ul style="list-style-type: none">• Amoxicillina/ acido clavulanico• Ceftriaxone o Cefotaxime + Metronidazolo• Ertapenem	<ul style="list-style-type: none">• Amoxicillina/ acido clavulanico• Cefuroxime + Nitroimidazolico• Fluorochinolone + Nitroimidazolico (se allergia ai β-lattamici)• Aztreonam + Nitroimidazolico (se allergia ai β-lattamici)

Infezioni gravi-ospedaliere

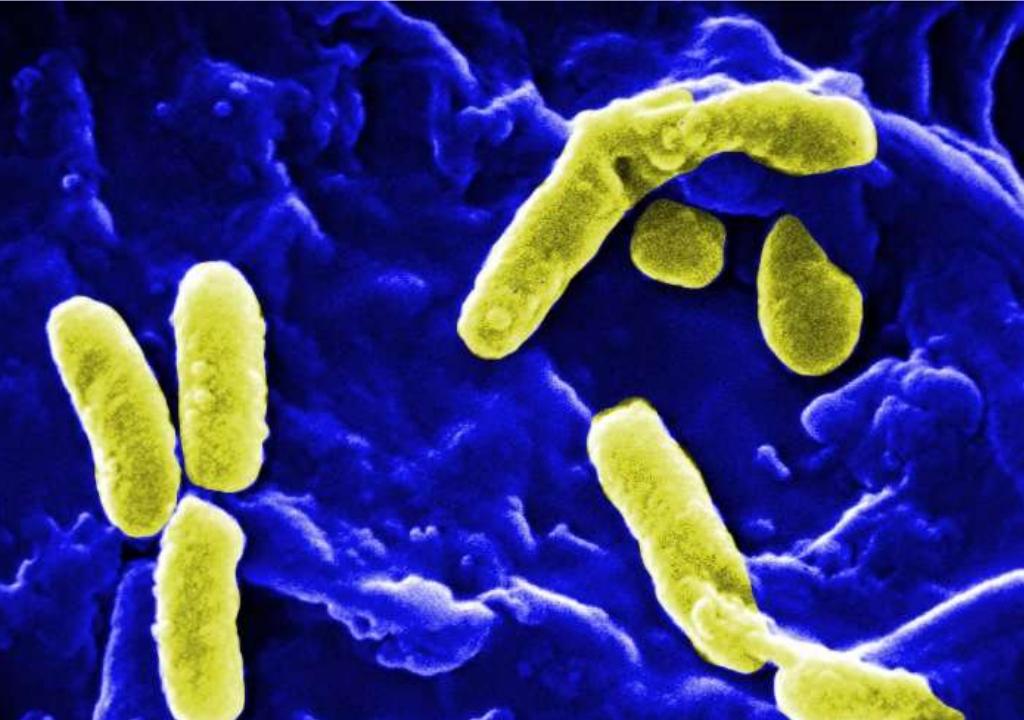
Solomkin JS	Mazuski JE	Tellado JM	Laterre PF
<ul style="list-style-type: none"> Piperacillina/tazobactam Imipenem/cilastatina Meropenem Cefalosporine III - IV (Cefotaxime, Ceftriaxone, Ceftizoxime, Ceftazidime, Cefepime) + Metronidazolo Ciprofloxacina + Metronidazolo Aminoglicosidi (gentamicina, tobramicina, netilmicina, amikacina) + metronidazolo o clindamicina 	<ul style="list-style-type: none"> Piperacillina/tazobactam Imipenem/cilastatina Meropenem Cefalosporine III – IV (Cefotaxime, Ceftriaxone, Ceftizoxime, Ceftazidime, Cefepime) + Metronidazolo o Clindamicina Aminoglicoside (Gentamicina, Tobramicina, Netilmicina, Amikacina) + Clindamicina o Metronidazolo Ciprofloxacina + Metronidazolo Aztreonam + Clindamicina 	<ul style="list-style-type: none"> Piperacillina/tazobactam Imipenem/cilastatina Meropenem Cefepime + Metronidazolo ± Ampicillina 	<ul style="list-style-type: none"> Piperacillina/tazobactam Carbapenemici Fluorochinolone + Nitroimidazolo ± Aminoglicoside (se allergia ai β-lattamici) Aztreonam + Nitroimidazolo ± Aminoglicoside (se allergia ai β-lattamici)

Infezioni gravi-ospedaliere

Solomkin JS	Mazuski JE	Tellado JM	Laterre PF
<ul style="list-style-type: none">Piperacillina/tazobactamImipenem/cilastatinaMeropenemO	<ul style="list-style-type: none">Piperacillina/tazobactamImipenem/cilastatinaMeropenem	<ul style="list-style-type: none">Piperacillina/tazobactamImipenem/cilastatinaMeropenem	<ul style="list-style-type: none">Piperacillina/tazobactamCarbapenemiciFluorochinolone + Nitroimidazolo ±
<p>(C Ce Ce Me • O Me</p>	<p>Le LG suggeriscono fra i possibili agenti eziologici della peritonite terziaria i cocci Gram-positivi multi-resistenti (MRSA) ed i miceti (Candida spp)</p>		
<p>In questi pazienti si dovranno pertanto utilizzare vancomicina, teicoplanina, linezolid o quinopristin/ dalfopristin nonchè fluconazolo o altri anti-micotici.</p>			
<p>Aminoglicosidi (gentamicina, tobramicina, netilmicina, amikacina) + metronidazolo o clindamicina</p>	<p>Netilmicina, Amikacina) + Clindamicina o Metronidazolo</p> <ul style="list-style-type: none">Ciprofloxacina + MetronidazoloAztreonam + Clindamicina		

Terapia delle infezioni

lievi-comunitarie

Solomkin JS	Mazuski JE	Solomkin JS	Mazuski JE
Ampicillina/Sulbactam Ticarcillina/Acido clavulanico Ertapenem Cefazolina o Cefuroxime + Metronidazolo Ciproloxacina, Levofloxacina, Moxifloxacina o Gatifloxacina, + Metronidazolo			Ilina/tazobactam m/cilastatina, hem porine di 3a-4a fotaxime, Ceftriazone, ne, Cefepime) + dazolo o icina icoside cina, Tobramicina, na, Amikacina) + icina o dazolo xacina + dazolo
			Aztreonam + Clindamicina

New Antibiotics

	MRSA VRE	Pneumos	Enterics/ Acineto	Pseudo monas
Oxazolidinones				
Streptogramins				
Daptomycin				
Glycopeptides				
Anti-PBP-2' ceph's				
Tigecycline				
Quinolones				
Iclaprim				
Ertapenem				

2008 ... Tentative guidelines on Anti-infective Agents for Complicated IAs

Type of Therapy	Class	Complicated Community-Acquired Infections		Health Care-Associated/Nosocomial Infections
		Without Risk Factor*	With Risk Factor*	
Single Agent	β-lactam/ β-lactamase inhibitor	Ampicillin/ Sulbactam Ticarcillin/Clav.	Piperacillin/Tazobactam	
	Fluoroquinolone	Moxifloxacin	Moxifloxacin	
	Glycicicline	Tygecicline	Tygecicline	
	Carbapenem	Ertapenem	Imipenem, Meropenem	
Combination Regimen	Cephalosporin-based	Cefazolin or Cefuroxime + Metronidazole	3 rd /4 th Gen. Cephalosporin + Metronidazole	
	Fluoroquinolone-based	Fluoroquinolone + Metronidazole	Ciprofloxacin + Metronidazole	

* Higher APACHE II scores, poor nutritional status, significant cardiovascular disease, patients with immunosuppression

NUOVI FATTORI DI RISCHIO

**Pazienti più compromessi
metabolicamente ed
immunologicamente in cui
si effettuano interventi più
complessi**

FACTORS RELATED WITH THE INCREASE OF NOSOCOMIAL CANDIDA INFECTIONS IN ICU

- Patients with underlying diseases
 - Mechanical ventilation
 - Immunocompromised patients
 - Multiple antibiotic therapy
 - Invasive procedures
-and prolonged ICU stay
- 

Isolamento sempre più frequente
anche nei **reparti chirurgici** oltre che di
terapia intensiva di **microrganismi**
multiresistenti agli antibiotici spesso
richiede terapie combinate e
prolungate per la loro eradicazione

Resistenze in Europa

Organism	France		Germany		Italy		Spain		UK	
	n	%	n	%	n	%	n	%	n	%
MRSA	53	28.3	36	20.0	76	36.4	39	20.4	21	21.6
Vancomycin-resistant <i>Enterococcus faecalis</i>	0	0.0	0	0.0	9	8.6	0	0.0	0	0.0
Vancomycin-resistant <i>Enterococcus faecium</i>	0	0.0	2	6.7	10	20.4	0	0.0	5	31.3
ESBL-producing <i>K. pneumoniae</i>	14	9.5	8	6.7	47	22.7	9	6.5	16	24.6
ESBL-producing <i>E. coli</i>	11	4.9	9	4.6	34	12.4	4	2.0	12	12.1

Resistant bacteria recovered from blood, CVC, wounds, drains – yr 2003

Policlinico “A. Gemelli” - Rome

	# Isolates	MRSA/S. aures	VR/E. faecium	VR/E. faecalis	ESBL/ E.coli	ESBL/ K.Pneum
Policlinico Gemelli	2322	148/299 49.4%	34/75 45.3%	4/172 2.3%	51/223 22.8%	28/84 33.3%
Medical Wards	1087	87/181 48%	11/30 36.6%	2/90 2.2%	16/141 11.3%	15/48 31.2%
Surgical Wards	960	46/98 46.9%	17/35 48.5%	2/57 3.5%	34/71 47.8%	12/33 36.3%
ICU	275	15/20 75%	6/10 60%	0/25 0%	1/11 9%	1/3 33%

Impatto della candidemia (candidosi invasive) nelle UTI

- 1/3 di tutte le candidemie contratte in ospedale
- Mortalità associata: 61%; mortalità attribuibile: 49%
- Candidemia+ shock: 60% delle morti vs batteriemia + shock: 46%
- Fattori associati a morte: trattamento inadeguato, biofilm+, Apache score III, *Candida non albicans*

*Guery B, Arendrup M, Auzinger G, Azoulay E, Borges M, Johnson EM, Müller E, Putensen C, Rotstein C, Sganga G, Venditti M, Zaragoza R, Kullberg BJ. et al .
Int Care Med, 2008, in press*

Distribuzione delle candidemie in ospedale

<u>Autore, anno</u>	<u>Studio</u>	<u>N° casi</u>	<u>% UTI</u>	<u>% chirurgia</u>
Tortorano, 2004	network europeo, prospettico, (1997-9)	1942	40.2%	44.7%
Luzzati, 2005	monocentrico, retrospettivo, (1992-7) (1998-01)	208 106	(72.1%) (60.3%)	(22.5%) (30.1%)
Almirante, 2005	14 centri, Prospettico (2000-3)	345	33.0% (33.7%)
Tumbarello, 2007	monocentrico, prospettico (2000-4)	294	34.7% (38.9%)	55.1%

(in arancione il % sul totale dei casi nosocomiali)

Invasive fungal infection

Parenchimal infection

Fungal

Septicemia in high risk pts

Persistent fever despite ant. ther.

Septic Shock

Please treat!

Candida in BAL

Candiduria

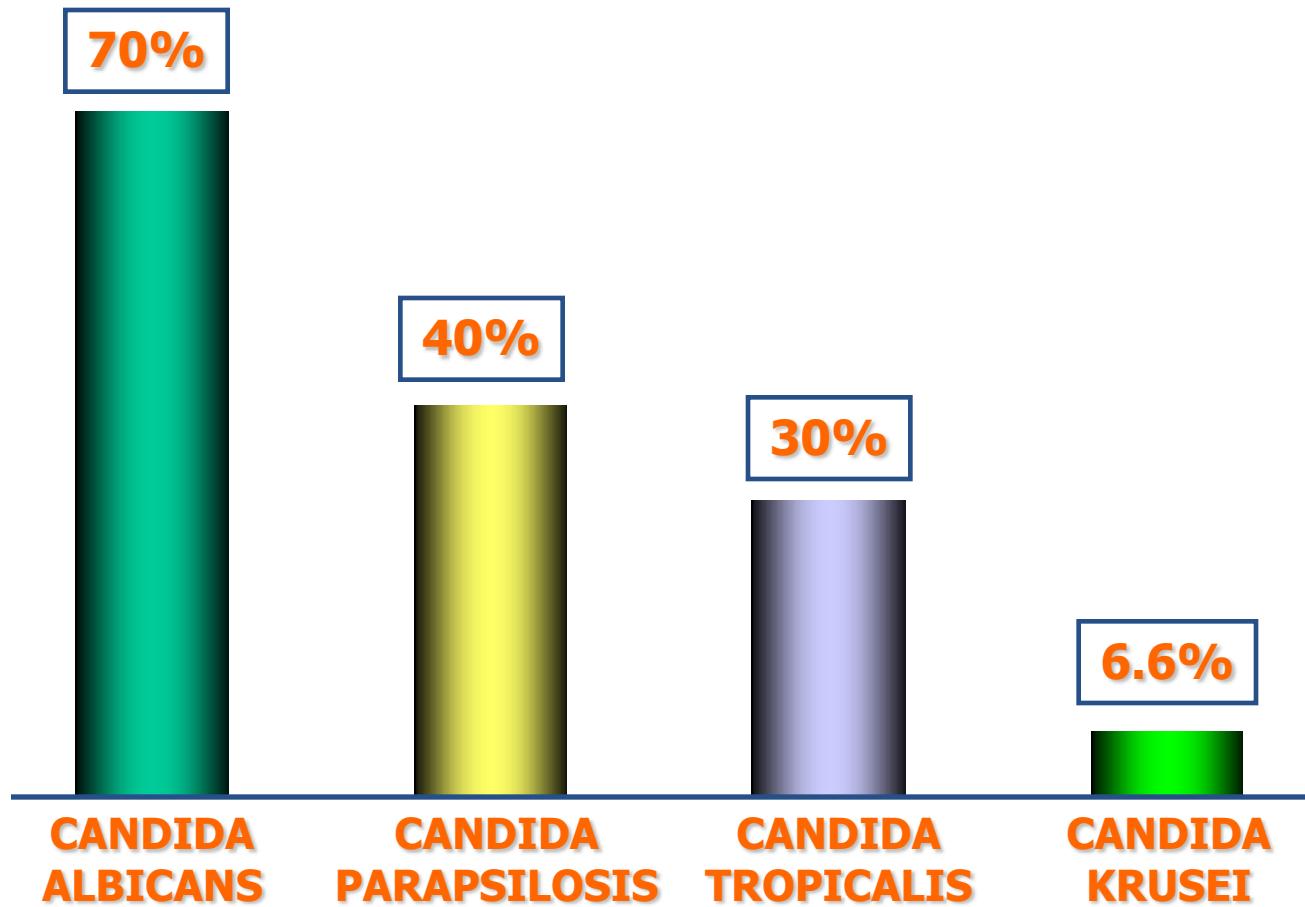
Candida in central drains

Candida in wound

Candida in cvc

Suppurative phlebitis

Candida infection in intra-abdominal sepsis



Antifungals

New molecules

1950

1960

1970

1980

1990

2000

2010

Amphotericin B deoxycholate 1958

Nystatin 1954

Flucytosine 1970

Ketoconazole 1981

Continuous infusion

Fluconazole 1990

L-AmB 1997

ABCD 1996

ABLC 1995

AMBI Load 2003

Voriconazole 2002

Caspofungin 2001

Higher dosage fluco 2000

Cochleates

Micafungin 2006

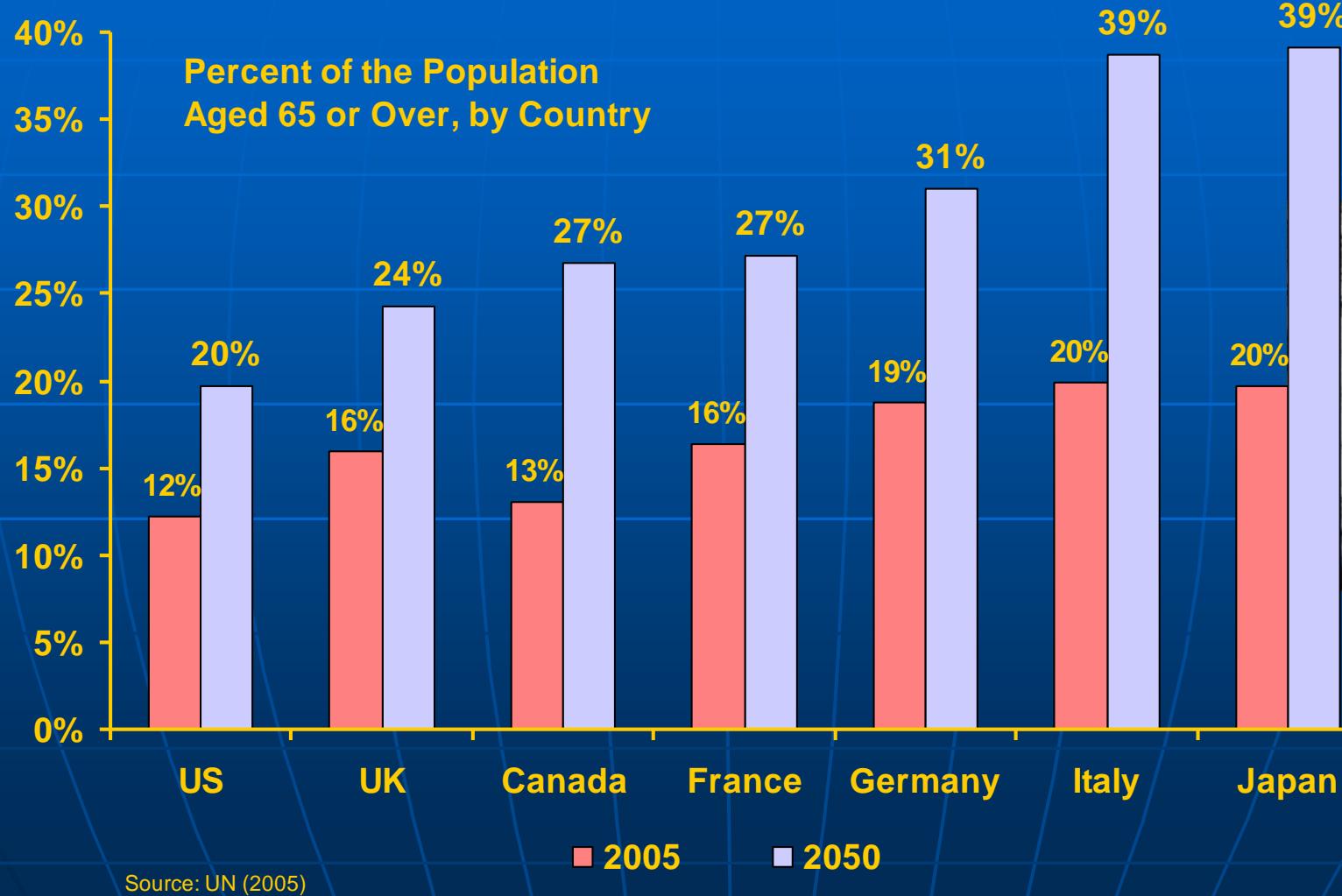
Anidulafungin 2008

INFEZIONI DA CANDIDA

FATTORI DI RISCHIO

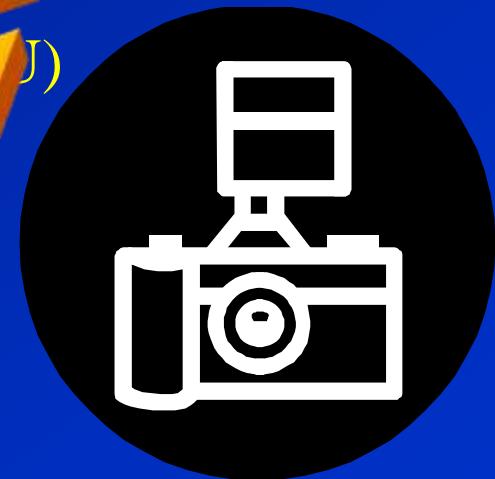
- Neutropenia
- Cateteri centrali
- Colonizzazione da Candida
- Antibiotici ad ampio spettro
- Durata degenza in ICU
- Ventilazione meccanica
- Trasfusioni ripetute
- Emodialisi
- Diabete
- Corticosteroidi
- Immunosuppressori
- Nutrizione parenterale
- Cateteri urinari

America's age wave is comparatively small.



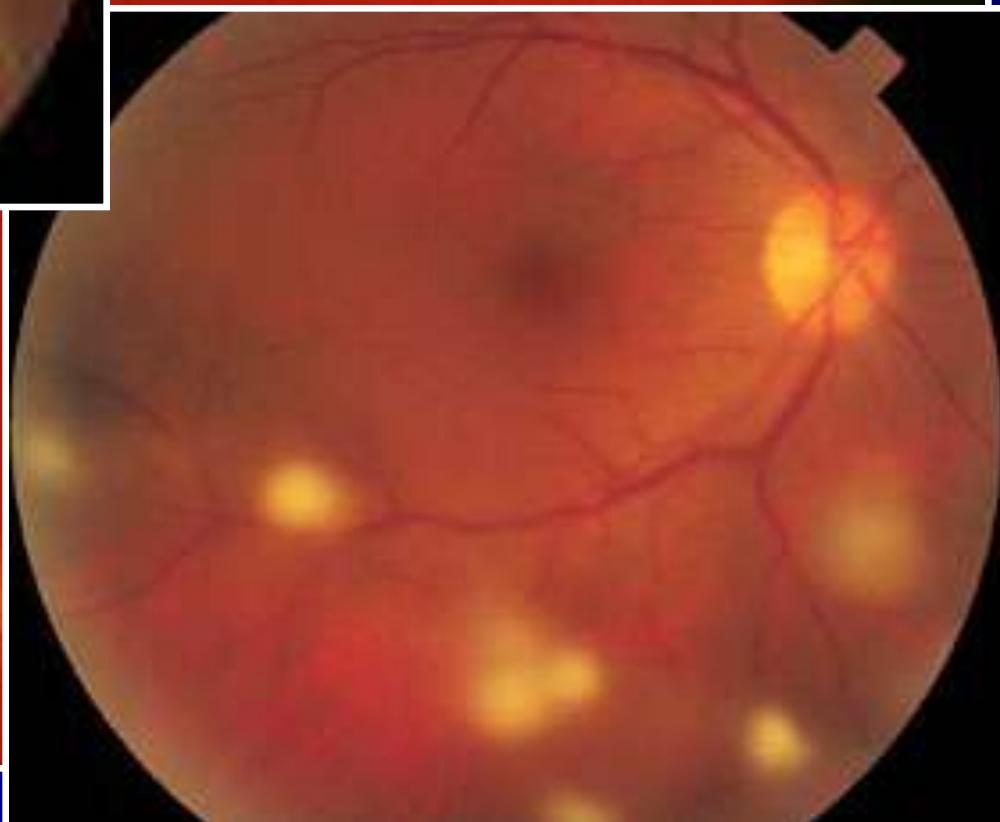
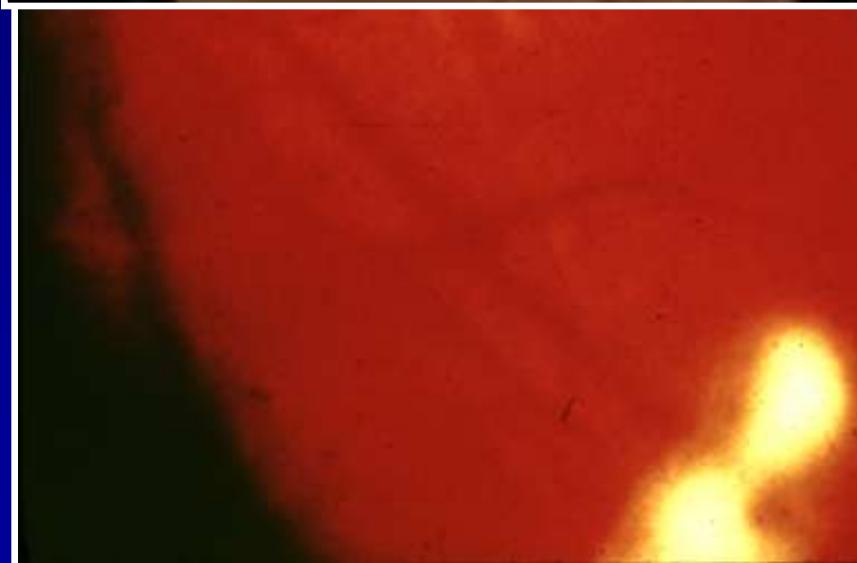
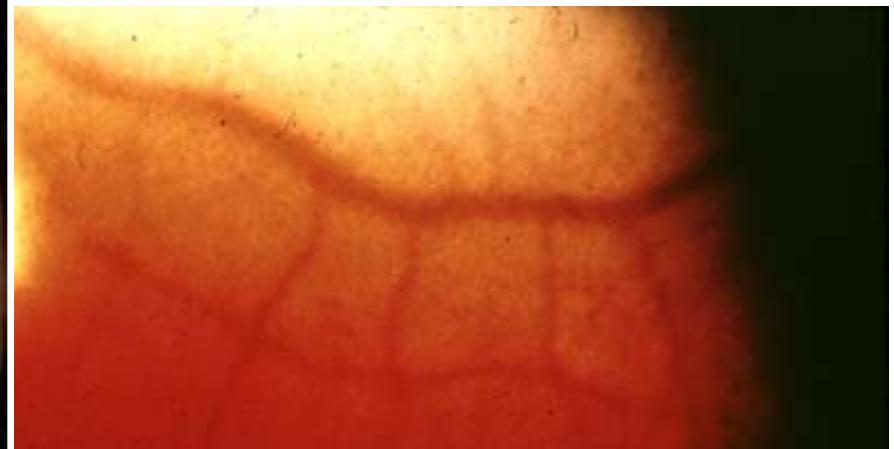
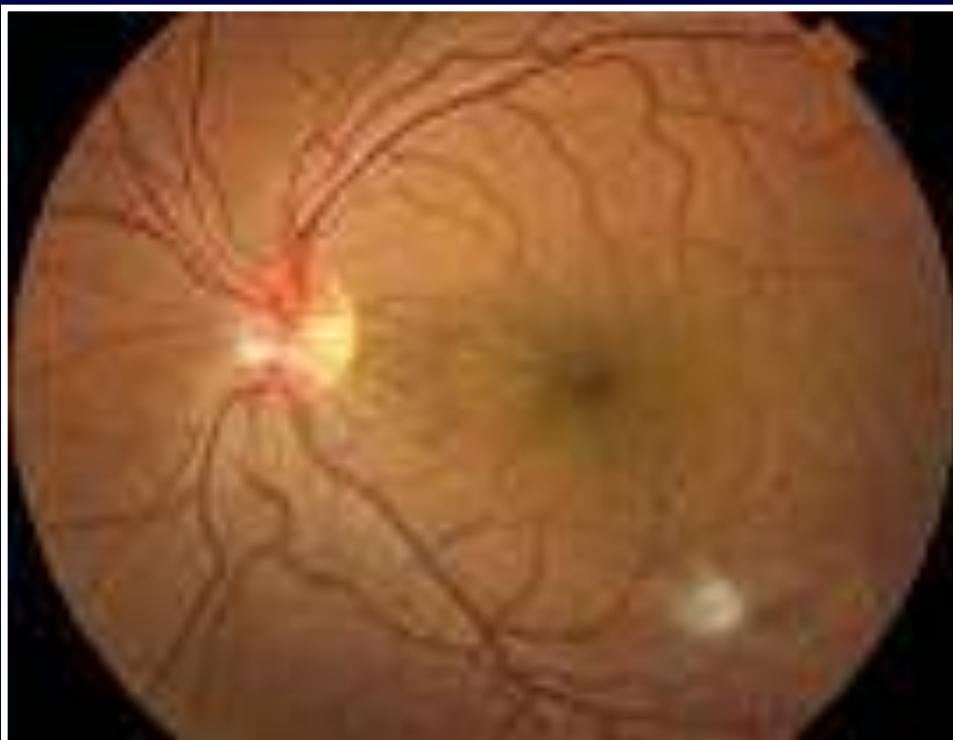
Ward: 40 beds (General surgery, kidney and liver transplant pts)

- 5 : 80 Y F: Multiple intraabdominal surgical procedures
C. albicans: drains, wound, blood, cvc
- 21 : 82 Y M: Miles for cancer (colon resection, liver resection)
C. albicans: wound, blood
- 22 : 75 Y M: Paroxysmal nocturnal hemoglobinuria (PNH)
C. albicans: wound, blood
- 25 : 85 Y F: Unknown
C. albicans: drains, wound, blood, cvc
- 29 : 78 Y M: Diabetic foot (Sepsis)
C. albicans: wound, blood
- 32 : 33 Y M: Kidney transplantation
C. albicans: urine
C. tropicalis: cvc
- 40 : 32 Y F: Liver transplantation (Fulminant hepatitis)
C. albicans: mouth, esophagus

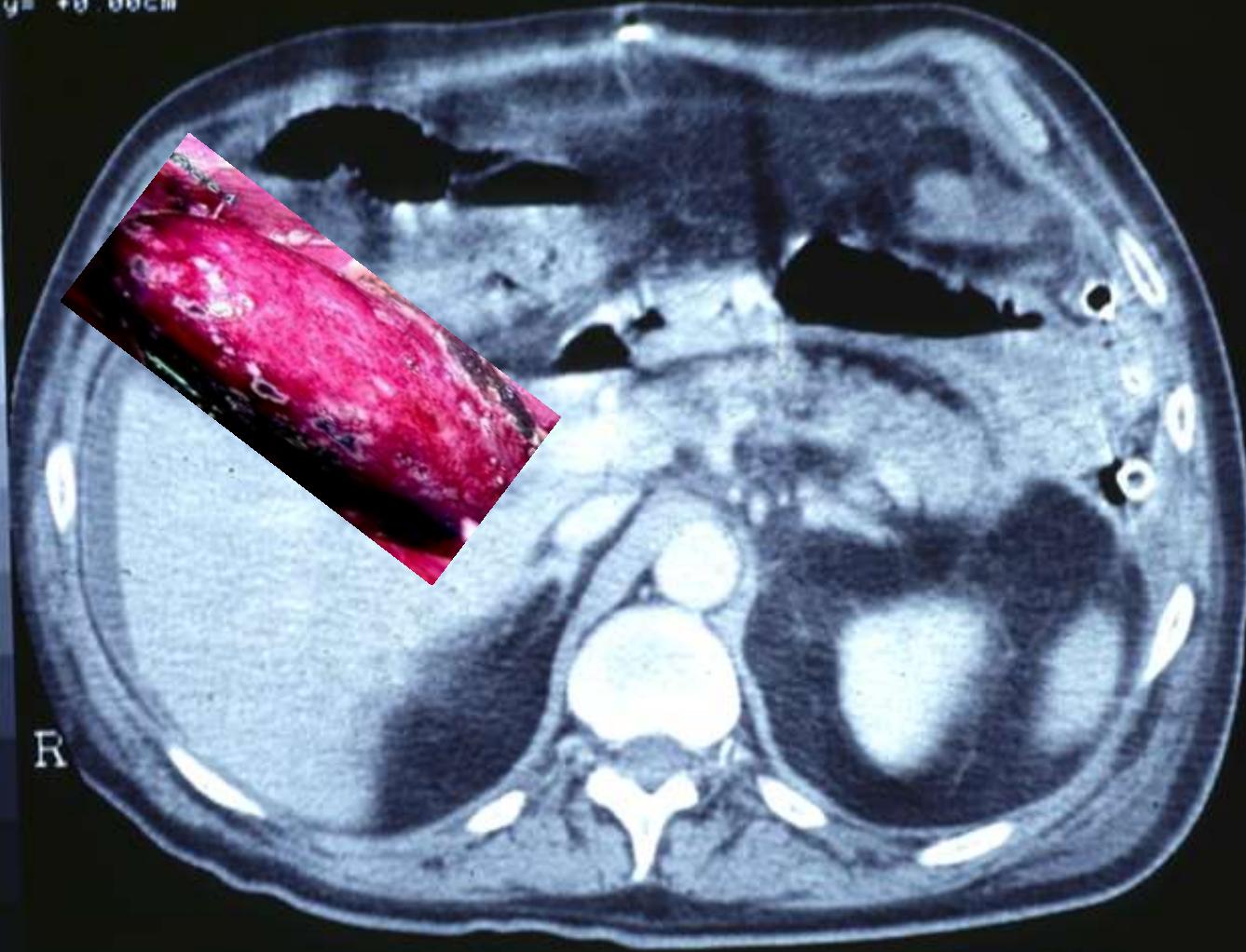


September 30, 2006

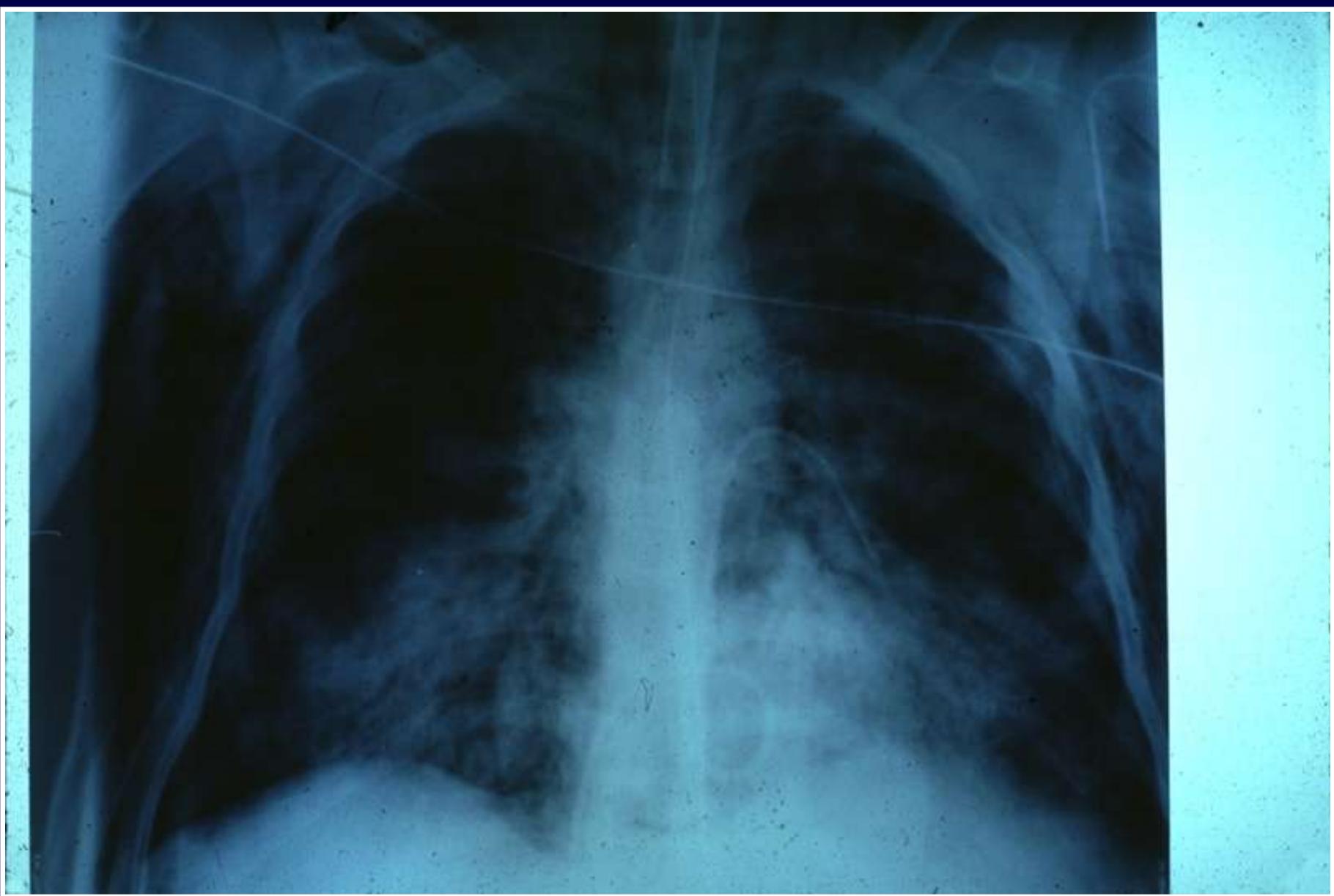




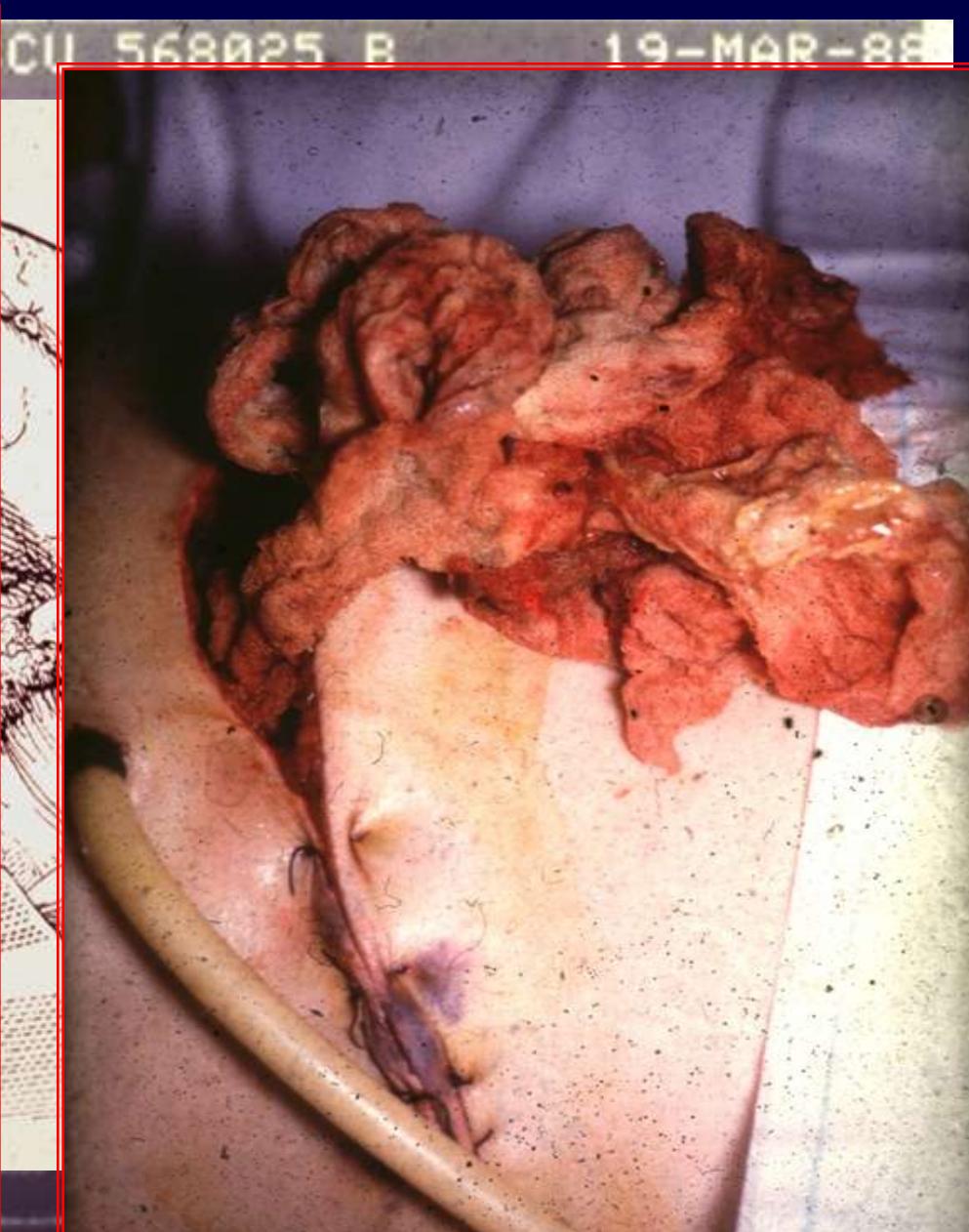
D, UHMW
37.0cm(STND)
x= +0.07cm
y= +0.00cm



120 kV
180 mA
3.0 sec
50-CRL







CU 568025 R

19-MAR-86

1ST RAD UNIV CATT ROMA

Preoperatorio

Fattori di rischio

Colonizzazione

Intraoperatorio

Contaminazione

Durata

Perdite ematiche

Corpi estranei

Postoperatorio

SIRS

ICU

Complicanza



Infezione Fungina

Monotherapy



Conclusions

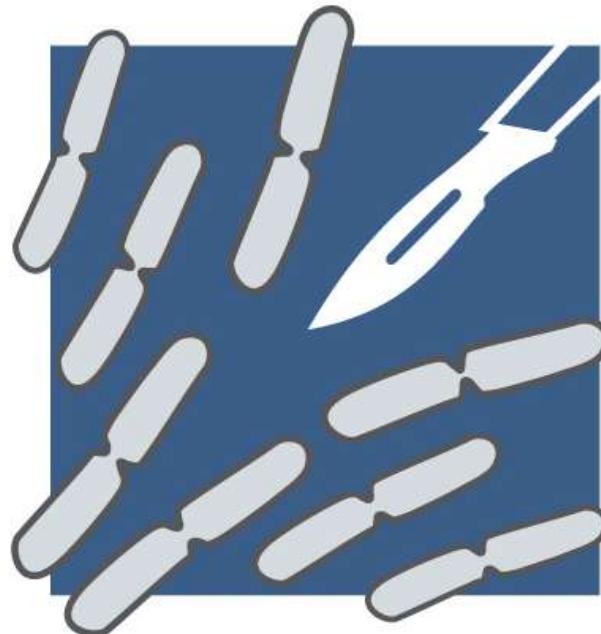
Combination therapy



Master

I livello “Nursing del paziente chirurgico settico”

II livello “Sepsi in Chirurgia”



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